COMPLEMENTARITY IN HEALTH INFORMATION MEDIA USAGE BY COLLEGE STUDENTS: AN APPLICATION OF MEDIA COMPLEMENTARITY THEORY IN THE CONTEXT OF HEALTH INFORMATION

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COMPLEMENTARITY IN HEALTH INFORMATION MEDIA USAGE BY COLLEGE STUDENTS: AN APPLICATION OF MEDIA COMPLEMENTARITY THEORY IN THE CONTEXT OF HEALTH INFORMATION

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ABSTRACT

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OF HEALTH INFORMATION

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With roughly 80% of Americans using the Internet, research into the
Internet's impact on other media outlets is of growing importance. The present
study employs Media Complementarity Theory to explain media consumption
behavior and also attempts to expound upon the theory. The present research
aims to test Media Complementarity Theory with a college student sample, and
attempts to isolate mechanisms key to understanding consumers’
complementary use of media. A sample of 185 undergraduates was solicited to
answer surveys that would assess their use of different media channels. The
study utilized a newly developed survey instrument. Additionally, the Internet
was divided into discrete channels. Results supported Media Complementarity
Theory.
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CHAPTER I

INTRODUCTION

In recent years a growing emphasis on health communication research and the emergence of the Internet as a ubiquitous medium have led to an increase in research focused on health information found on the Internet. Online health information research is of growing importance due to the rising number of Internet users, the amount of information available to those Internet users, and the ease with which that information can be accessed. In 2009, more than 80% of Americans used the Internet (USC, 2009). Of those Internet users, eight out of ten sought out a health related topic online (Fox, 2005).

On the Internet one may find numerous sources of health information. Websites, such as WebMD, empower users to conduct their own research about diseases, formulate diagnoses, and discover treatments without ever leaving their seat. Via email, individuals have the ability to communicate with doctors and other medical professionals. Message boards and blogs allow users the opportunity to indirectly interact with others who may share their health concerns or circumstances. Also, a number of free podcasts dealing with an array of health topics are regularly published to the Internet and available for download to
computers and mobile devices. The Internet now gives consumers access to a wealth of health information, much of which is free of charge and available at the click of a button.

**Literature Review**

**Health Information Seeking**

Health information seeking has long been a focus of research by medical professionals and communication scholars. One focus of much of the published health information seeking research has been the information seeking behavior of patients. However, a number of articles published in medical journals have studied information seeking from the perspective of health care professionals. The need for health information seeking research has increased with the availability of information via media outlets, especially the Internet. Researchers have studied the impact of health information on the attitudes and behaviors of health care professionals and patients.

In order to stay informed on current health topics and medical research health care professionals must seek out newly published and updated information. The emergence of the Internet has enabled physicians to access a wealth of information through a single medium. Research has shown that health care professionals use the Internet as an informational resource for a variety of reasons (Bennett, Casebeer, Kristofco, & Strasser, 2004). In 2003, physicians reported using the Internet to access on-line medical journals and literature, seek
additional information for patient-specific issues, complete continuing medical education courses, and communicate with colleagues and patients (Bennett et al., 2004). The Internet, however, is not the only source to which health care professionals turn for their informational needs. Medical colleagues and traditional media are also popular sources for health care professionals to find health information (Owen & Fang, 2003). Faculty at a health sciences university reported colleagues as the most useful source of health information followed by the Internet, then medical journals, databases, and books. A more recent study found that a majority of the health care professionals surveyed reported paying attention to the health information disseminated by media outlets (Newnham, Burns, Snyder, Dowling, Ranieri, Gray, and McLachlan, 2005). These health care professionals revealed that their two principal reasons for monitoring traditional broadcast, print, and Internet health information were to be prepared to answer patient questions and to assess the accuracy of the information (Newnham et al., 2005). Nearly all of the health care professionals surveyed believed that information available on the Internet had the potential to be deleterious to patients. The health care professionals suspected that information from the Internet could lead to unrealistic expectations and the requisition of potentially risky or novel medical treatments by patients (Newnham et al., 2005). An example of this was found among colon cancer patients. Information seeking among colon cancer patients was positively correlated with hearing about and receiving innovative treatments for the disease (Gray, Armstrong, DeMichele, Schwartz, & Hornik, 2009). Additionally, Cline and Haynes (2001) outline a
number of criticisms of health information available on the Internet. The potentially harmful health information on the Internet has been described as inaccurate, unreliable, and incomplete (Cline & Haynes, 2001).

The prevalence of health information seeking has also been found to impact the physician-patient relationship. A 2010 article published in the New England Journal of Medicine reported that patients are increasingly using the Internet as their first source for health information (Hesse, Moser, & Rutten, 2010). The impact of this shift in patients’ information seeking behavior has been the focus of previous research. One potential unintended outcome of the pervasiveness of health information on the Internet is physicians may be inclined to feel threatened by patients who have acquired health information on their own (McMullan, 2006). This harmful outcome may be especially likely in relationships between doctors who do not perceive themselves to be competent Internet users and patients who are heavy consumers of Internet health information.

A more positive potential outcome for doctor-patient relationships is an increase in doctors and patients working together toward a single goal. Patients, who have more time to focus on their specific conditions than their doctors, can seek out information on the Internet. After finding information the patient can then set up an appointment to meet with the physician to discuss the implications and possible applications of the newly discovered health information to the patient’s particular situation. The physician in this instance would also serve as a knowledge source to help the patient better understand the meaningfulness of
the information gathered by the patient and the credibility of the source of that information.

The third potential outcome outlined by McMullan (2006) is the physician acting as a gatekeeper of Internet resources. Whereas the second outcome involved the patient seeking health information on the Internet independently and prior to discussing it with their doctor, in the third case the doctor recommends web-based resources to the patient as a means to learn more about the condition. McMullan’s (2006) patient- or health care professional-centered perspectives have been explored in other health information seeking literature as well.

McMillan and Macias (2008) attempted to better understand what differentiates heavy health information seeking Internet users ages 55 years and older from those who are less likely to seek health information. In doing so two typologies of older Internet users emerged in regards to their health information seeking behaviors. The first group, health traditionalists, was characterized by lower levels of Internet use for health information. The other group, health technologists was identified as such due to their high levels of Internet use for health information. Those grouped in the health traditionalists category were significantly more likely than health technologists to prefer physician-centered health interactions (McMillan & Macias, 2008). Physician-centered interactions are those in which the health care provider takes on a more active and controlling role while the patient assumes a more passive role. On the other hand, the preference for patient-centered interactions with physicians has been positively
correlated with the frequency of health information seeking behaviors and with
the number of sources from which that information is sought (Baldwin, Cvengros,
Christensen, Ishani, & Kaboli, 2008). Additionally, those who preferred patient-
centered roles were found to have used a variety of traditional media sources as
well as the Internet for health information. These findings echo the proposition
put forth by McMullan (2006), in that patients who are empowered users of the
Internet have shifted from passive receivers of health information to active
seekers of health information. An important finding in terms of indentifying what
predisposes some people to seek health information on the Internet was
uncovered by Rains (2008a). The role that Internet self-efficacy plays in health
information seeking was explored. Rains (2008a) found that Internet self-efficacy
mediated the relationship between individuals’ perception of information quality
from the Internet, feelings of conducting successful Internet searches, and their
repeated use of the Internet for health information seeking. It can, therefore, be
reasoned that an important factor in predicting individual’s health information
seeking behavior is not their actual skill level with the Internet, but rather the
degree to which individuals believe that they can effectively utilize the skills they
possess for finding health information on the Internet. The role of Internet self-
efficacy in health contexts could also explain findings suggesting that satisfaction
with Internet use leads to repeat Internet use (Lee, Park, & Widdows, 2009).
Barriers to Health Information Seeking on the Internet

Many potential barriers to Internet health information seeking have been examined in order to further determine the factors that influence who seeks health information and why they seek it. Identified barriers to health information seeking range from personal health condition to ethnicity to external factors such as parents’ education level, Internet access technology, and geographic location (Ball-Rokeach & Wilkin, 2009; Longo, Ge, Radina, Greiner, Williams, Longo, Mouzon, Natale-Pereira, & Salas-Lopez, 2009; Rains, 2008b; Shaw, Dubenske, Han, Cofta-Woerpel, Bush, Gustafson, & McTavish, 2008; Zhao, 2009). It is not surprising that those patients who perceived themselves to be in more dire condition are more likely than others to seek out health information (Shaw et al., 2008). The notion is that those individuals who think they need more information or who perceive more potential benefit from seeking information will, in turn, seek information more than others. What are perhaps surprising are the findings suggesting the differences in health information seeking among different ethnicities. Several studies have compared the health information seeking behaviors of Latina and non-Latina women. Longo et al. (2009) reported that non-Latina breast cancer patients were significantly more likely to seek health information from interpersonal and Internet sources than Latina breast cancer patients. Similarly, Ball-Rokeach and Wilkin (2009) reported differences between the health information seeking behaviors of Hispanics and Anglos. The differences in health information sources, however, were more robust than initially suspected. Findings showed that Hispanics surveyed reported heavy use
of media sources that were geographically or ethnically targeted rather than
typical English language mainstream media. Ball-Rokeach and Wilkin (2009)
concluded that surveys that do not account for non-mainstream geographically or
ethnically targeted perhaps underestimate the health information seeking
behaviors of ethnic populations.

Research has suggested that differences in health information seeking on
the Internet may be due to educational or literacy factors. The impact of parents’
education level on children’s use of the Internet for health information was
studied in order to determine if children with less educated parents were less
frequent users of the Internet for health information (Zhao, 2009). Findings from
this study showed that children with less educated parents not only used the
Internet to seek health information, but they were just as likely or more likely to
do so than children from more highly educated parents. Zhao (2009) suggested
that the reason for this could be that children with less educated parents may be
more confident Internet users than their parents and, therefore, seek out
information on the Internet for their parents as well as themselves. In
considering the role that one’s ability to comprehend and process health
information plays in health information seeking behavior, Shieh, Mays, McDaniel,
and Yu (2009) studied the health information seeking behavior of pregnant
women. Results showed that pregnant women with lower levels of health literacy
were less likely to use the Internet as a source for health information than
pregnant women with high health literacy (Shieh et al., 2009). On the other
hand, pregnant women with both high and low levels of health literacy used other
media sources for health information similarly. Shieh et al. (2009) suggested that the discrepancy in Internet use might have been due to differences in Internet access availability. The differences between individual's likelihood to use the Internet for health information seeking for broadband and dial-up Internet users has been noted as a key factor in previous research (Fox, 2005). Broadband Internet users are typically more likely to use the Internet more than dial-up users for general and health information seeking (Rains, 2008b). Another factor often associated with increased Internet use is age (Fox, 2005). Young people are the most active Internet users, however, their health information seeking behavior has not been as extensively researched as older Internet users.

Health Information Seeking Among College Students

Research on the health information seeking behavior of young adults is not as well documented in academic publications as is that of other populations. An abundance of research has been published focusing on the health information seeking behaviors of older adults, especially those 50 years and older, and those who have been previously diagnosed with a disease, especially cancer (Fraze & Wong, 2008; Niederdeppe et al., 2007; Shim, Kelly, & Hornik, 2006; Tian & Robinson, 2008). Adults ranging in age from 18-29 are a particularly active group online and their health information seeking behavior is deserving of closer examination (Rainie, 2010). Ninety-three percent of those adults age 18-29 use the Internet, and 77% of them report having searched for some form of health information (Fox, 2005; Rainie, 2010). The three most sought after health topics
by those in this age group are information about a specific disease, diet/nutrition, and fitness/exercise (Fox, 2005). Fifty-six percent of those 18-29 who searched for health information reported searching for information about a specific disease, and nearly half of those 18-29 who searched for health information looked for information on diet/nutrition (47%) and fitness/exercise (49%) (Fox, 2005). Since 2002, Internet searches for information about diet/nutrition and fitness/exercise have increased (Fox, 2005).

A specific at-risk population within the 18-29 year old age group is college students. College students fit the mold of those most likely to seek out health information online (Albano et al., 2003). Most college students are under the age of 65, likely to be Internet users, educated, and typically have access to broadband Internet connections, all things that previous research has shown to increase the likelihood of using the Internet as a source for health information (Fox, 2005). Vincent and Basil (1997) found that as college students’ grade level increased, so did their use of multiple media sources for information. Therefore, if health information seeking behavior is viewed as a surveillance gratification, it is reasonable to suggest that as college students advance in both education and age, their health information seeking behavior can be expected to increase. Furthermore, the high rate of disordered eating among college students has made the diet and nutrition behavior of college students the focus of a large amount of research (Giles, Helme, & Kcmar, 2007; Harrison & Cantor, 1997). It can be reasoned that because college students typically have access to a variety
of dining options and exercise facilities, they are also highly likely to be seekers of information specifically about diet/nutrition and fitness/exercise.

Additionally, college students can be considered an at-risk population because of the social independence and dietary responsibility that they assume for the first time upon entering college (Albano et al., 2003). First year college students transition from a lifestyle in which many of their dietary choices and fitness activities were established and structured over a number of years or with the help of others to an unfamiliar environment in which their diet and exercise choices are new and left for them alone to establish. Albano et al. (2003) suggested that the uncertainty that college students encounter because of their newfound independence leads many of them to the Internet to find answers to their questions about health. With virtually all college students having access to the Internet, either on campus or off, the Internet is a major source for college students for health information. Additionally, students who face the prospect of managing their health, diet, and exercise for the first time will often look to peers as well as media sources for guidance. However, in a media rich college environment students are faced with choices about which media sources to use in order to gather information. The media source selection decisions that college students make for health information depend on a number of factors.

Internet and Traditional Media

Communication scholars have long been interested in consumers’ media selection behavior and the effect that emerging and new media sources have on
established media sources. Popular culture commentators have suggested that in a battle between traditional media and new media, the latter is destined for victory and the former will become a relic (Doctorow, 2009; Graham, 2009; Penenberg, 2005). Throughout the years, critics have opined that books and magazines would be replaced by radio, and that newspapers and radio would be replaced by television. The birth of the television music video network “MTV” in 1981 was marked by a bold but less than prophetic displacement view claim that “video killed the radio star” (“The Buggles,” 2009).

In recent years the discussion has resurfaced with more intensity and popular culture attention than ever due to the emergence of the Internet. Research into the role of the Internet is of growing importance considering that as of 2009 more than 80% of Americans log onto the Internet (USC, 2009). The rise and ubiquity of the Internet raises many questions about the impact of the Internet on other media. Where will consumers turn to gather information about important topics? Will television, radio, newspapers, and other media be deemed useless due to the emergence of the Internet? How will the media of the future change the way that people obtain information?

Media Complementarity Theory

According to Media Complementarity Theory, access to a medium is not as important a factor in selection as the effectiveness of that medium in gratifying a consumer’s needs (Dutta-Bergman, 2004a). Because college students
represent an at-risk group in terms of health, it is important to study where they receive their health information and their media selection behavior.

In opposition to the idea that new media will replace or displace traditional media, Media Complementarity Theory suggests that consumers will utilize media sources in a complementary fashion (Dutta-Bergman, 2004a). That is, media consumers will utilize as many media sources as necessary to satisfy their needs. For example, if one is interested in politics or a specific political story he or she would likely go online to read about it, watch television stories about it, listen to radio news about it, and read newspaper stories about it, until his or her need for information is gratified. Thus, Media Complementarity Theory states that the driving force behind the use of particular media sources is the content of the media source rather than the delivery method or technology (Dutta-Bergman, 2004a, 2006; Tian & Robinson, 2008a). According to Media Complementarity Theory, consumers are driven to use media sources based on the content provided by that media source rather than the traditional or new media nature of the source.

Moreover, in opposition to the assumptions upon which displacement theory is based, Media Complementarity Theory suggests that time is not the critical factor in media selection (Dutta-Bergman, 2004a). Dutta-Bergman (2004a) suggested that consumers’ media use behavior is better conceptualized as a consumer-centered pursuit of information in order to satisfy needs, rather than a media-focused or technology-centered battle over the consumer’s time. Whereas the displacement framework focuses on a finite amount of time to use
all media as a limiting factor in media selection, Media Complementarity Theory suggests that media use behavior is not a zero-sum game (Kayany & Yelsma, 2000). Media Complementarity Theory research has focused principally on message content and issue salience to explain the complementary use of media.

Issue salience played a pivotal role in early Media Complementarity Theory research. Implicit in the research is the belief that the greater the issue’s saliency to consumers, the more they are expected to utilize media and the more media sources they ought to utilize in their search for information. In more recent Media Complementarity Theory research, however, issue salience was statistically controlled in order to test for complementary media channel use in the absence of differences of issue salience. Tian and Robinson (2008a) utilized health information seeking data gathered from cancer patients. Individuals diagnosed with cancer and those who perceived their illness to be more severe were considered to have higher levels of salience than those individuals who had not been diagnosed with cancer. Results showed that after controlling for cancer diagnosis status (cancer patients or cancer free adults) and illness severity, complementarity was still present (Tian & Robinson, 2008a). Thus, it can be reasoned from these findings that the salience of an issue is not the principle mechanism behind the complementary use of media sources.

Dutta-Bergman (2006) emphasized the importance that Media Complementarity Theory places upon the functional needs of the consumer. For instance, if a consumer’s desire is to be entertained, then he or she will likely use a variety of media sources in order to achieve a satisfactory level of personal
entertainment. It should be evident, then, that the foundation of Media Complementarity Theory is drawn from uses and gratifications theory. The role that traditional and new media channels play in satisfying consumers’ needs and as functional alternatives to one another has been studied before from a uses and gratifications theory perspective (Perse & Courtright, 1993). Functional alternatives are different media channels that are helpful in satisfying similar communication needs (Perse & Courtright, 1993). That is, a functional alternative is a media channel or number of different media channels that have the ability to help fulfill one’s communication needs beyond the use of a single media channel. In their attempt to unveil functional alternatives, Perse and Courtright (1993) discovered a number of media channel clusters. The five clusters discovered included a combination of newer and older media channels. The channel clusters were created by conducting a cluster analysis, which grouped media channels according to how helpful each channel was in satisfying consumers’ particular needs. Furthermore, a number of significant correlations were found between the clusters of functional alternatives, suggesting that consumers used a variety of traditional and new media channels to satisfy communication needs. These findings offer both support for and insight into Media Complementarity Theory. Media Complementarity Theory is supported, in that users in the study consumed a variety of traditional and new media channels to satisfy needs (Perse & Courtright, 1993). Perse and Courtright (1993) may help explain the driving force behind Media Complementarity Theory by suggesting that consumers perceive new media channels to be more similar to
traditional channels rather than more different from them. Media consumers who are focused on the content of the media channels will likely seek out multiple sources for information. These users will also likely understand new media channels in the context of more familiar traditional media channels and thus their use of new media channels may be dependent upon their use of traditional media channels.

Media Complementarity Theory has been tested in a number of studies and in a variety of contexts. Media Complementarity Theory was initially tested as a framework to study the information seeking activities of individuals in regards to a variety of news types and the use of different media types to fulfill interpersonal needs of individuals after a crisis (Dutta-Bergman, 2004a; 2004b). The findings showed strong support for the theory, in that those who used the Internet to access information about particular types of news (politics, sports, international affairs, etc.) were more likely to use traditional media outlets for information concerning those subjects, as well (Dutta-Bergman, 2004a). Additionally, those consumers that used the Internet to fulfill their need for interpersonal communication were more likely to use a telephone as a traditional means of gratifying their need for interpersonal communication (Dutta-Bergman, 2004b). Other studies of Media Complementarity Theory have analyzed the relationship of new and traditional media channels within the context of politics and government (Dutta-Bergman & Chung, 2005; Jiang & Dutta-Bergman, 2005). Dutta-Bergman and Chung (2005) found that the use of the Internet for political information was positively correlated with the use of traditional media channels.
for political information, as well as with voting activity. Jiang and Dutta-Bergman (2005) found that individuals who communicated with their local government using new technology were more likely to have also communicated with their local government using traditional means of communication. These studies further support Media Complementarity Theory by displaying consumers’ usage of a variety of traditional media and the Internet to gratify their individual needs (Dutta-Bergman & Chung, 2005; Jiang & Dutta-Bergman, 2005). The central tenants of Media Complementarity Theory are supported by demonstrating that media use is driven by the consumers’ desire to gratify personal needs, and that consumers use a combination of new and traditional media to achieve their gratification.

More recently, Media Complementarity Theory has been applied to the health information seeking behavior of cancer patients (Tian & Robinson, 2008a; 2008b). Tian and Robinson (2008a) studied the complementarity relationships of three communication channels: traditional media, face-to-face communication, and the Internet. The study supported the assumption that media consumers will use a variety of channels (traditional media, the Internet, and face-to-face communication) to gather information about the health information they desire (Tian & Robinson, 2008a). Both cancer patients and non-patients used traditional media, the Internet, and face-to-face communication in complementary fashions.
Information Seeking and Scanning

Included in Tian and Robinson's (2008b) investigation of Media Complementarity Theory was a distinction between information seeking and incidental information acquisition. Incidental information acquisition was conceptualized as unintentional or not explicitly goal driven media use (Tian & Robinson, 2008b). The notion of incidental information acquisition is similar to information scanning behavior, which has been explored in other research (Frazer & Wong, 2008; Niederdeppe et al., 2007; Shim et al., 2006). Whereas information seeking is active, purpose-driven exposure to information outside of one's routine interpersonal and media habits, information scanning is defined as "information acquisition that occurs within routine patterns of exposure to mediated and interpersonal sources that can be recalled with a minimal prompt" (Niederdeppe et al., 2007, p.154). Tian and Robinson (2008b) found that younger cancer patients displayed more information scanning behavior than did older cancer patients. Overall, information scanning has been found to be more common than information seeking (Kelly et al., 2008). However, information seeking behavior is most common among younger females with high levels of education (Shim et al., 2006). The present research will utilize an index of information seeking and scanning data to thoroughly assess media channel use. Information seeking and information scanning will be measured in order to uncover any complementarity that could potentially be overlooked if only one of the two distinct behaviors was measured.
Individual Channels of the Internet

The term “traditional media” is used throughout the Media Complementarity Theory literature to refer to a number of print and electronic media channels (Dutta-Bergman, 2004a; 2004b; 2006; Tian & Robinson, 2008a; 2008b). The term traditional media describes a grouping of media usually consisting of television, radio, newspapers, magazines, and books. In an attempt to gain a broader understanding of the subtleties of Media Complementarity Theory, the present research will partition the medium typically studied as the Internet into individual channels based upon each channel’s unique profile. The Internet will be divided into the following discrete channels: company Web sites (Web sites created and run by a for profit company), individual’s Web sites (Web sites created and run by individuals), news Web sites (Web sites created and run by news agencies), video hosting websites, message boards, podcasts, individual’s blogs (blogs written by individuals), news blogs (blogs written by individuals who work for a news agency), and company blogs (blogs written by employees of a for profit company). Because the present research uses a novel and more elaborate conceptual definition of the Internet, the first hypothesis will seek to reproduce findings similar to those of Media Complementarity Theory research before considering any other variables. Therefore, the first hypothesis states:

H1: Individuals’ use of traditional media channels will predict Internet media use.

In a further attempt to isolate and empirically study additional aspects of Media Complementarity Theory, the present study will analyze the role that an
individual's perception of a media channel's utility plays in media selection. As Dutta-Bergman (2006) has noted, Media Complementarity Theory bases its assumption of individual media choice in selective exposure. Selective exposure suggests that individuals choose what media to consume as well as on what to focus their attention (Zillman & Bryant, 1985). In terms of Media Complementarity Theory, Dutta-Bergman stated that individuals will choose “media forms that are most likely to serve the functions that are personally relevant to them” (2006, p. 475). However, in order to further test the explanatory power of Media Complementarity Theory, the present study attempts to establish complementarity in media channel use while controlling for perceived utility of each media channel. Additionally, implicit in previous Media Complementarity Theory research is issue salience or interest as a driving force behind media selection. The present research will also statistically control for issue salience in an effort to deepen our understanding of the mechanism behind Media Complementarity Theory and the relationship between media channel use. The following hypotheses are drawn to test for issue salience and channel utility: 

H2: Perception of issue salience will predict Internet media use.

H3: Perception of Internet channel utility will predict Internet media use.

H4: After controlling for issue salience and channel utility, as well as age and gender, Internet channel use will be predicted by traditional media channel use.
CHAPTER II

METHODS

The present study will address an area of concern in previous Media Complementarity Theory research. Much of the research testing Media Complementarity Theory has utilized secondary data analysis (Dutta-Bergman, 2004a; 2004b; 2006; Tian & Robinson, 2008a; 2008b). Therefore, by creating an original survey instrument and conducting data analysis particularly for the purpose of testing and advancing Media Complementarity Theory. The present research will serve as a necessary addition to Media Complementarity Theory literature.

Participants

Approval from the Institutional Review Board (IRB) was received prior to soliciting participants. The students of ten undergraduate communication classes at a private, Midwestern university were solicited via convenience sampling. The participating instructors of the ten classes awarded minimal extra credit points to those students who completed the survey. The classes are required for every undergraduate at the university, which allows for a diversity of majors and year classifications to be involved. The university has nearly 6,500
undergraduate students. Approximately 250 students were invited to participate in the survey. One hundred eighty-five participants completed the entire survey. Of the 185 participants, 116 (62.7%) were female and 67 (36.2) were male. Two participants declined to report their sex. Participant’s ages ranged from 17 to 55 years. The mean age of respondents was 19.6 years (SD= 3.021), and 90.2% of respondents were between 18-20 years old.

Procedures

Students in the selected courses were given a uniform resource locator (URL) by their instructor. The URL directed them to a secure online survey. All potential respondents have access to computers and the Internet on campus and in student housing at the university, and therefore having an online survey will be appropriate and ideal for the present research. Instructors will distribute the URL’s on two consecutive class days so that absences do not limit the number of participants. The instructors will be asked to offer limited extra credit for each student’s participation in the survey. “Checkbox” by Prezza software will used to administer the survey. To provide anonymity, this survey tool clears IP addresses and stores data on a secure server. Prior to beginning the survey, participants will be shown a message explaining the subject matter of the survey. To proceed into the survey, subjects must indicate that they agree to participate and that their involvement is voluntary.
Measurement

The survey was comprised of 52 items, including demographic questions. The conceptual definition of traditional media channels included: magazines, television, radio, books, documentaries, and newspapers. Internet channels included: company Web sites (Web sites created and run by a for profit company), individual’s Web sites (Web sites created and run by individuals), news Web sites (Web sites created and run by news agencies), video hosting websites, message boards, podcasts, individual’s blogs (blogs written by individuals), news blogs (blogs written by individuals who work for a news agency), and company blogs (blogs written by employees of a for profit company).

To assess media channel use, questions gauging information seeking and information scanning behavior were on the survey. Adaptations of Kelly et al.’s (2008) information seeking and information scanning questions were utilized. Information seeking behavior was measured by asking, “In the past 12 months, how many times have you looked for information about (diet/nutrition, fitness/exercise) from the following sources (answer for each source).” A listing of all of the traditional and Internet media channels was presented. Response options for each source were: “not at all,” “one or two times,” “three or more times,” and “I don’t recall.” Cronbach’s alpha was conducted to ensure reliability.

The information scanning question stated: “In the past 12 months, how many times did you hear or come across information about (diet/nutrition, fitness/exercise) from each of the following sources when you were not actively
looking for it (answer for each source).” A list of each of the traditional and Internet media channels was given. Response options for each source were: “not at all,” “one or two times,” “three or more times,” and “I don’t recall.”

In order to more accurately evaluate media channel use, time spent using each media channel was measured with two items. The first item read, “In a typical week, how often do you look for information about (diet/nutrition, fitness/exercise) from each of the following sources?” Response options were, “never,” “one or two times,” “three or more times,” and “I don’t recall.” The second item stated, “In a typical day, how much time (in hours) do you spend reading about, viewing, or listening to (diet/nutrition, fitness/exercise) information from each of the following sources?” A list of each traditional and Internet media channel was given after each item. Next to each channel respondents typed their numerical answer.

Two items assessed the perceived utility of each media channel. The first item was adapted from Albano et al. (2006) and stated, “(Each media channel) is effective in providing information about (diet/nutrition, fitness/exercise).” Subjects responded using a five-level Likert-type scale that ranged from “Strongly Disagree” to “Strongly Agree.” The second item stated, “(Diet/nutrition, fitness/exercise) information from (each media channel) is useful.” Respondents answered using a five-level Likert-type scale that ranged from “Strongly Disagree” to “Strongly Agree.”

Four items measured perceived issue salience. The measurement tool was adapted from Gantz and Greenberg (1990). Two of the items measured
social salience and the remaining two items measured personal salience. The social salience items gauged the degree to which the respondent thought the issues were important for the United States and a typical adult. The personal salience items measured the degree to which the respondent thought the issues were important to him/herself and to other college students. Gantz and Greenberg (1990) reported a reliability coefficient of .73. The salience questions read, “Rate the importance of (diet/nutrition, fitness/exercise) information for (the United States of America, a typical adult, a typical college student, yourself). The respondent then selected a rating for his or her perception of issue salience from 1 to 10, with higher numbers indicating more importance. The four scores were then summed to create an index of perceived issue salience.

Finally, two demographic questions concluded the survey. Respondents were asked, “What is your gender?” and “What is your age?” The demographic questions were used as control variables.

Data Analysis

Data analysis was performed with Statistical Package for the Social Sciences (SPSS) version 17.0. To test the first hypothesis (H1), a multiple linear regression analysis procedure was run with Internet channel use as the outcome variable and traditional media channel use as the predictor. Using simultaneous regression allowed for the testing of the overall hypothesis, that traditional media channel use predicts Internet channel use, and allowed the researcher to explore which of the individual traditional media channels were significant predictors of
Internet channel use. For the regression, each of the individual variables of traditional media channel use was entered in a single block of the regression analysis. The outcome variable, Internet media channel use, was comprised of all of the individual channels of the Internet collapsed into a single variable. Hypotheses two and three (H2, H3) were tested using two separate regression analyses. Hypothesis two stated, “Perception of issue salience will predict Internet media use.” To test this hypothesis, each of the eight perception of issue salience items were entered in a single block as the predictor variables in the regression, and the index of Internet channels used was the outcome variable. Hypothesis three stated, “Perception of Internet media channel utility will predict Internet media use.” For this regression, a single index of perceived Internet media channel utility will be entered as the predictor variable, and the index of Internet channels used will be the outcome variable. The index of perceived Internet media channel utility will be created by summing the eight items used to measure perceived utility. The fourth hypothesis (H4) stated, “After controlling for issue salience and channel utility, as well as age and gender, Internet channel use will be predicted by traditional media channel use.” H4 was tested using a three-step hierarchical regression analysis. The demographic variables, age and gender, were entered simultaneously in the first step. The two other control variables, perceived channel utility and issue salience were subsequently entered together in a single block of the second step. Finally, each of the individual traditional media channel use variables will be entered simultaneously in the final step of the regression analysis.
CHAPTER III

Results

Reliability of Media Use Measures

In order to ensure the reliability of the newly developed multiple measure indices for each media channel, the Cronbach’s alpha statistical procedure was run. As previously stated, the four media channel use questions were summed to create a single index for each media channel and for each health behavior. The sum of the four questions for diet/nutrition and fitness/exercise were then combined according to media channel. Therefore, each media channel use variable was composed of a total of eight use questions with higher scores indicating greater use of each media channel for health information. Since eight items were used to measure a single variable, acceptable reliability scores were crucial to the present research. In general, reliability scores for each media channel ranged from $\alpha = .729$ for books to $\alpha = .829$ for magazines. The remaining traditional media channel use measures, television ($\alpha = .765$), radio ($\alpha = .736$), documentaries ($\alpha = .736$), and newspapers ($\alpha = .788$), were also deemed reliable. The Internet media channel use measures were also reliable for each channel, company run Web sites ($\alpha = .813$), individual’s Web sites ($\alpha = .773$), news Web
Traditional Media Use Predicts Internet Media Use

The first hypothesis (H1) stated, “Individuals’ use of traditional media channels will predict Internet media use.” A multiple linear regression analysis was conducted to test this hypothesis. Each of the six traditional media channel use variables were input into a single block of the regression as the predictor variables, and an index of all of the combined Internet channel use variables was input as the dependent variable. Results of the regression supported the first hypothesis. The combination of traditional media use variables significantly predicted the use of the Internet ($R^2 = .357$, $F = 16.459$, $p < .001$), thus indicating that those users who were greater consumers of traditional media were also more likely to use the Internet for health information. However, when controlling for each of the other traditional media channels used, only documentary use ($\beta = .301$, $p < .001$) and newspaper use ($\beta = .274$, $p = .001$) significantly predicted Internet media channel use. Magazine use ($\beta = -.112$, $p = .180$), television use ($\beta = .114$, $p = .206$), radio use ($\beta = .065$, $p = .724$), and book use ($\beta = .066$, $p = .732$) were not significant predictors of Internet use when controlling for each of the other traditional media use variables. See Table 1 for detailed output and statistical values.
Table 1

H1: Traditional Media Use As A Predictor of Internet Media Use

**Model Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
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<td>R Square Change</td>
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<td></td>
<td></td>
<td>F Change</td>
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<sup>a</sup> Predictors: (Constant), Newspapers Use, Magazine Use, Radio Use, Book Use, Documentary Use, Television Use

**ANOVA**

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<th>Model</th>
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<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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</tr>
<tr>
<td></td>
<td>Total</td>
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<td>82696.162</td>
<td></td>
<td></td>
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</tbody>
</table>

<sup>a</sup> Predictors: (Constant), Newspapers Use, Magazine Use, Radio Use, Book Use, Documentary Use, Television Use

<sup>b</sup> Dependent Variable: Overall Internet Media Use

**Coefficients**

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
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<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td>F</td>
</tr>
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<td>1 (Constant)</td>
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<tr>
<td>Magazine Use</td>
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<td>Television Use</td>
<td>.647</td>
<td>.510</td>
<td>.114</td>
<td>1.609</td>
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<tr>
<td>Radio Use</td>
<td>.444</td>
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<td>.065</td>
<td>.724</td>
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<td>Book Use</td>
<td>.407</td>
<td>.476</td>
<td>.066</td>
<td>.732</td>
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<td>Documentary Use</td>
<td>2.193</td>
<td>.568</td>
<td>.301</td>
<td>14.879</td>
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</table>

<sup>a</sup> Dependent Variable: Overall Internet Media Use
Issue Salience As A Predictor of Internet Media Use

Hypothesis two (H2) stated that those who perceived health information to be more salient would be greater users of the Internet for health information. The reliability of the eight salience items was first examined by conducting Cronbach’s alpha. The Cronbach’s alpha for the eight items measuring issue salience was deemed highly reliable ($\alpha = .892$). Subsequently, a multiple linear regression analysis was run with each of the eight salience items input into a single block as the predictor variables and the index of Internet channel use as the dependent variable. The overall linear combination of the eight salience measures was non-significant (R square= .055, $F= 1.282$, $p= .256$).

However, the regression analysis output showed that two of the eight salience measures were significant predictors of Internet media use when controlling for the other salience measures. Diet and nutrition salience for the typical college student ($\beta = -.387$, $F= 5.683$, $p= .018$) and fitness and exercise salience for the typical college student ($\beta = .290$, $F= 4.277$, $p= .040$) were significant predictors of Internet media use given the removal of each of the other measures of issue salience. Both of the significant measures focused upon questions of the importance of health issues to people similar to the respondent, but not the actual respondent. Diet and nutrition salience for the typical college student had a negative relationship with Internet media channel use, such that when salience increased, use of Internet media channels decreased. However, as fitness and exercise salience for the typical college student increased, so did...
the use of Internet media channels. See Table 2 for detailed results and statistical values.

**Perceived Channel Utility As A Predictor of Internet Media Use**

The third hypothesis (H3) stated that the perception of Internet media channel utility would predict Internet media use. An acceptable Cronbach’s alpha value was first attained for the eight measures of perceived channel utility ($\alpha = .917$) in order to determine a high level of reliability for the measures to be used as a single index. After reliability was insured, a linear regression analysis was conducted with perceived channel utility as the predictor variable and Internet media channel use as the dependent variable.

The results of the regression supported the hypothesis, such that users’ perception of an Internet channel’s utility significantly predicts Internet channel use ($\beta = .337$, $F = 23.513$, $p < .001$). See Table 3 for detailed results and statistical values.

**Complementarity In The Absence of Issue Salience and Perceived Channel Utility**

The fourth and final hypothesis (H4) posited that media channel use would be complementary in the absence of issue salience and channel utility. To test hypothesis four, a three step hierarchical regression analysis was performed. The demographic variables of age and sex were input simultaneously into the first block of the regression. The perceived channel utility variable and issue
Table 2

H2: Issue Salience As a Predictor of Internet Media Use

<table>
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<tr>
<th>Model</th>
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<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
<th>F Change</th>
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<th>Sig. F Change</th>
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<td>1.282</td>
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<td>.256</td>
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</table>

a. Predictors: (Constant), Fit and Exer Salience for Self, D and N Salience for United States, Fit and Exer Salience for College Student, D and N Salience for Self, Fit and Exer Salience for Typical Adult, D and N Salience for Typical Adult, D and N Salience for College Students, Fit and Exer Salience for United States

**ANOVA**

<table>
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<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<tr>
<td></td>
<td>Residual</td>
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<td>444.000</td>
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<tr>
<td>Total</td>
<td></td>
<td>184</td>
<td>444.000</td>
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<td></td>
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</table>

a. Predictors: (Constant), Fit and Exer Salience for Self, D and N Salience for United States, Fit and Exer Salience for College Student, D and N Salience for Self, Fit and Exer Salience for Typical Adult, D and N Salience for Typical Adult, D and N Salience for College Students, Fit and Exer Salience for United States

b. Dependent Variable: Overall Internet Media Use
Table 2 (continued)

<table>
<thead>
<tr>
<th>Model</th>
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<td>Sig.</td>
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<td>D and N Salience for United States</td>
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<td>D and N Salience for Typical Adult</td>
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<td>D and N Salience for College Students</td>
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<td>D and N Salience for Self</td>
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<td>Fit and Exer Salience for United States</td>
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<td>-.400</td>
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<td>Fit and Exer Salience for Typical Adult</td>
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<td>Fit and Exer Salience for Self</td>
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<sup>a</sup> Dependent Variable: Overall Internet Media Use
Table 3
H3: Perceived Channel Utility As A Predictor of Internet Media Use

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<th>Adjusted R Square</th>
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<th>Coefficientsa</th>
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<td>F Change</td>
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<td>Sig. F Change</td>
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<td>.114</td>
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<td></td>
<td>.000a</td>
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a. Predictors: (Constant), Internet Media Channel Utility

ANOVAb

<table>
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<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
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<td>9415.623</td>
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<td>.000a</td>
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<tr>
<td>Residual</td>
<td>73280.539</td>
<td>183</td>
<td>400.440</td>
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<td>Total</td>
<td>82696.162</td>
<td>184</td>
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<td></td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Internet Media Channel Utility
b. Dependent Variable: Overall Internet Media Use

c. Dependent Variable: Overall Internet Media Use
salience variables were input into the second block together. In the third and final block of the regression, the traditional media use variables were input. The overall regression model was significant at step three ($R^2 = .405, F = 11.719, p < .001$). Age was non-significant at step three of the model ($\beta = .057, F = .868, p = .353$). Interestingly, sex was a significant predictor of Internet media use at the first ($\beta = .182, F = 6.191, p = .014$) and second steps ($\beta = .164, F = 5.526, p = .020$) of the regression analysis, suggesting that males use Internet media more than females. However, at the third step of the regression analysis, sex was not a significant predictor of Internet use when controlling for traditional media use ($\beta = .057, F = .868, p = .353$). Additionally, issue salience was not found to be a significant predictor of Internet media use at the second ($\beta = .021, F = .091, p = .764$) or third ($\beta = -.035, F = .333, p = .564$) steps of the regression analysis. The final control variable, perceived channel utility was significant at the third step of the regression model ($\beta = .230, F = 14.358, p < .001$), indicating that the more useful that users perceive the Internet media channels to be the more likely they will be to use them for health information, even when controlling for each of the other variables. The most theoretically important findings of the regression analysis dealt with the predictive ability of traditional media use after controlling for age, sex, issue salience, and perceived channel utility. The findings of the hierarchical regression analysis supported the hypothesis. After controlling for age, sex, issue salience, and perceived channel utility, traditional media use was a significant predictor of Internet media channel use, uniquely
accounting for 25.8% of the variance (R square= .258, F= 12.452, p< .001). See Table 4 for detailed results and statistical values.
Table 4

H4: Traditional Media Use As a Predictor of Internet Media Use When Controlling for Salience and Utility

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
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<td>R Square</td>
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a. Predictors: (Constant), Dummy Code Sex, Age
b. Predictors: (Constant), Dummy Code Sex, Age, Salience Overall, Internet Media Channel Utility
c. Predictors: (Constant), Dummy Code Sex, Age, Salience Overall, Internet Media Channel Utility, Television Use, Documentary Use, Book Use, Radio Use, Newspapers Use, Magazine Use

d. Dependent Variable: Overall Internet Media Use

ANOVA<sup>d</sup>

<table>
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<tr>
<th>Model</th>
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<th>Mean Square</th>
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</tbody>
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a. Predictors: (Constant), Dummy Code Sex, Age
b. Predictors: (Constant), Dummy Code Sex, Age, Salience Overall, Internet Media Channel Utility
c. Predictors: (Constant), Dummy Code Sex, Age, Salience Overall, Internet Media Channel Utility, Television Use, Documentary Use, Book Use, Radio Use, Newspapers Use, Magazine Use
d. Dependent Variable: Overall Internet Media Use
Table 4 (continued)

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<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
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<th>Correlations</th>
<th>Collinearity Statistics</th>
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<tr>
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<td>.037</td>
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<td>Age</td>
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<td></td>
<td>Internet Media Channel Utility</td>
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<td>.230</td>
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<td>-.041</td>
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<td>Radio Use</td>
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<td></td>
<td>Newspapers Use</td>
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<td>.272</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Overall Internet Media Use
CHAPTER IV

Discussion

As hypothesized, traditional media channels and Internet media channels were used complementarily by the college student sample. The college student sample used in the present research served not as a limitation, but as an opportunity to analyze a specific at-risk group whose media use behavior for health information had previously been widely under-researched. The importance of understanding where college students get their information about the health subjects that are probably most pertinent to them, which in this case were identified as diet/nutrition and fitness/exercise, will be relevant not only to future scholars, but also to universities and colleges that seek to provide helpful information to their students about health issues. The present research aimed to uncover college students’ media use behaviors in the context of health information guided by Dutta-Bergman’s Media Complementarity Theory, whilst extending and expounding upon the theory.

The first hypothesis was proposed to test the ability of the present research to replicate the findings of previous Media Complementarity Theory research. Replication of a complementary relationship was important because the present research utilized an original self-report survey instrument and
parametric statistical tests that had not been used in prior Media
Complementarity Theory research. The results of the regression analysis testing
hypothesis 1 did, in fact, lend support for the earlier findings of Media
Complementarity Theory research, in that those who were heavy users of
traditional media were also more likely to be users of Internet-based media. The
ability of the present research to uncover findings in support of Media
Complementarity Theory through the use of a new multi-item measures and
survey instrument further endorses the theory’s validity while addressing a
shortcoming identified in previous Media Complementarity Theory research. The
use of an original survey instrument with highly reliable measures of media
channel use provides future researchers with a foundation for original survey
design in Media Complementarity Theory research. The survey was designed to
account for the secondary data analysis that has been typical of Media
Complementarity Theory research to this point. The separation of the Internet
into a number of distinct channels was useful in the present research to create a
more robust measure of what is becoming an increasingly diverse medium.
Future research ought to continue to explore and develop the multiple channels
of Internet media measure, and more closely explore the complementary use of
Internet based media channels with one another.

The findings of hypothesis two (H2) produced mixed results. The overall
linear combination (p = .256) and six of the eight individual measures of salience
were non-significant in the regression analysis. The two significant predictors in
the regression were the items asking specifically about the importance of
diet/nutrition and fitness/exercise for typical college students. A few potential explanations as to why these findings were uncovered ought to be discussed. The first possible explanation is the idea of a “third-person effect.” The third-person effect has been widely documented in media research, especially media effects research (Borzekowski, Flora, Feighery, & Schooler, 1999; Chapin, 1999; Matera & Salwen, 1999; Paul, Salwen, & Dupagne, 2000; Potter, 2003). The third-person effect, as it applies to the present study, suggests that there is a discrepancy between the extent to which individuals view their own susceptibility to external factors and the extent to which they perceive others’ susceptibility. That is to say, the students in the sample may have felt that they personally did not need to worry about diet/nutrition or fitness/exercise, but, having witnessed unhealthy behaviors by others like them, they felt that diet/nutrition and fitness/exercise ought to be important to other college students. Perhaps they felt as if their present health behaviors were better than the typical college student, and therefore diet/nutrition and fitness/exercise are more important for others than themselves.

A second perspective on the salience findings is that perhaps since college students are generally healthier than their older counterparts and still typically covered under their parents’ health insurance, they may be less likely to feel vulnerable to health threats and therefore place less salience on health issues. This is to say that since many college students are still covered under their parents’ health insurance and still seeing their same doctor when they are home from school, they may not be as “at-risk” as previously thought. A third
potential explanation for the salience findings could be the frequent and ubiquitous use of the Internet among college students. College students have such easy access to the Internet that a relatively low level of salience is needed as a catalyst for them to use the Internet for health information. It can be argued that, the effort required to use the Internet to find health information is so minimal that students will seek out or scan through even issues of little importance to them and others. Therefore there is no need for an issue to be of great salience to the media consumer for them to consume the information.

The third hypothesis attempted to test the perception of Internet media channels’ utility as a means to predict their use. The significant findings of hypothesis three support the idea that media consumers most utilize those channels that they perceive to be useful in satisfying their needs. In short, an Internet media channel that the consumer does not think will help them achieve their goal is less likely to be used by that consumer. The utility measure was principally included in the present research as a control variable for the fourth hypothesis.

Hypothesis four attempted to expound upon Media Complementarity Theory by establishing a complementary relationship between consumers’ use of traditional media channels and Internet media channels while controlling for two underlying forces potentially responsible for the relationship. The present test of Media Complementarity Theory included attempting to either rule out or uncover potential mechanisms, or driving forces, responsible for the phenomenon of complementary media use. It was hypothesized that if a complementary media
use relationship existed between consumers’ use of traditional and Internet media after controlling for issue salience and perceived channel utility those two factors could be ruled out as theoretical mechanisms by future researchers. This would expand our understanding of consumers’ complementary media use. As the results of the regression for hypothesis four indicate, a complementary relationship existed even after removing the effects of the demographic variables of age and sex, as well as the control variables, issue salience and perceived channel utility. Thus, we can conclude from the present findings that consumers’ complementary media use behavior must be due to factors other than age, sex, issue salience, and perceived channel utility. In fact, the present research showed that traditional media use alone uniquely accounted for over a quarter (25.8%) of the variance in Internet media use.

Additionally, it should be noted that these findings are perhaps even more surprising given the college student sample. College students, and young people in general, are often thought to be the most fleeting users of traditional media channels and most loyal consumers of Internet media channels. However, the present findings suggest that when it comes to health information college students will use traditional media sources in concert with Internet media channels to gather information.

Practical and Theoretical Implications

These findings support the notion that it is highly unlikely that traditional media channels will be completely replaced by the Internet. As has been the
case in the past, traditional media channels have typically survived the invention and adoption of newer media. Perhaps the ability of traditional media outlets to survive is due, at least in part, to their ability to evolve, adapt, and create or find their own niche. For instance, the technology and features of today’s televisions and radios are much more advanced than their predecessors. Another potential reason for the staying power of traditional media outlets is their ability to provide unique content in different contexts. Some media are more portable than others, some can be used while doing other activities, for instance driving or working out, and still others require much more effort to use. Moreover, the needs of consumers will drive them to use as many or as few media sources as possible. The finding that perceived channel utility predicted use of the Internet suggests that the needs and expected benefits of media use may be a driving force behind media consumption. Perception of channel utility may have been a rudimentary measure of expected gratification. Therefore, future research that incorporates uses and gratifications theory with Media Complementarity Theory may uncover the specific role that expected gratifications play in consumer media channel selection.

Limitations

Notation of the limitations of the present research will allow future researchers to address the shortcomings and: 1) further increase our understanding of the unique aspects of college students’ media use for health information; and 2) develop and extend Media Complementarity Theory to new
samples and contexts. First, although college students were the target population for the present research, the use of a convenience sample selected only from undergraduate communication courses at a single university will likely limit the generalizability of the findings. Using students from one university may have resulted in a somewhat homogenous sample, lacking geographic, cultural, and economic diversity. Moreover, the fact that the university is a mid-sized, religiously affiliated, private university may have also increased the likelihood of selecting a sample lacking diversity, thus decreasing the generalizability of the findings.

Secondly, the use of a self-report survey instrument meant that the findings depended entirely upon the student-participants’ ability to accurately recall their media use behavior. The use of multiple measures for participants’ media use behavior was intended to address this potential shortcoming. The highly reliable media use measures provide some assurance, in that participants’ self-reported responses were consistent across the multiple items for each medium.

The third limitation of the present research was the lack of an established, precise gauge of media use. Throughout Media Complementarity Theory research the measures of media use have been less than ideal. They have ranged from dichotomous responses to attention-gauging items to time-of-use measures. Media Complementarity Theory, however, should not rely on such measures of media use. Media Complementarity Theory rejects the notion that time spent using media channels is the principle limiting factor of consumers’
media use behavior. It would, therefore, be ideal if research based on Media Complementarity Theory would not depend on measures of time spent using each medium. Additionally, the use of dichotomous response measures limits the power of statistical procedures that researchers may use to analyze the data. Early Media Complementarity Theory research used mostly chi-square procedures to identify users and non-users of traditional and Internet media channels (Dutta-Bergman, 2004a; 2004b). For the present research, a new survey was developed in order to reliably measure media use behavior as well as allow for the use of regression analysis procedures. It is hoped that the newly developed survey will be useful for future Media Complementarity Theory research.

Future Research

The convoluted and congested media environment of today makes identifying the mechanisms and subtleties behind consumers’ media use increasingly difficult to identify. By employing qualitative research, such as one-on-one or focus group style interviews, researchers may be better able to indentify a number of potential mechanisms behind consumers’ complementary media use behavior. Understanding the role that level of processing and self-efficacy may reveal mechanisms for complementarity. Once these potential mechanisms have been elicited through qualitative research, researchers can then conduct quantitative research and statistically control for those variables to determine their impact in terms of the theory.
Rains’ (2008a) work with Internet self-efficacy also provides promising insights into media use behavior. The application of the self-efficacy variable into Media Complementarity Theory research may help researchers better understand the role that individual differences play in complementary media use behavior. If, as Rains (2008a) found, Internet self-efficacy mediates media channel use then Media Complementarity Theory research will benefit from isolating and controlling the variable.

As previously mentioned, the development of consistent measures that are both valid and reliable is crucial for future Media Complementarity Theory research. Developing a scale of media use that can be applied to a variety of media channels and contexts will allow researchers to produce studies with consistent procedures as well as enable the emergence of uniform findings.

Future Media Complementarity Research should also continue to focus on a variety of populations and contexts. The present research focused specifically on the college student population as a means to better understand the ways that younger media consumers incorporate traditional and Internet media channels into their health information use behaviors. The results indicating complementarity in media use were perhaps somewhat surprising, considering that college students were a relatively untapped population prior to the present Media Complementarity Theory health research. It is important for researchers to continue testing Media Complementarity Theory in a variety of contexts and with different populations in order for the theory to continue to develop.
Conclusion

Perhaps video did not kill the radio star, but it certainly had an impact. It has become evident that new media channels can have a tremendous impact on those media channels that were previously established. However, Media Complementarity Theory provides a lens through which to conceptualize consumers’ media use behavior in a variety of contexts. By framing research through Media Complementarity Theory the notion of a zero-sum game for media use is set aside in favor a perspective that places its central focus on the consumer of the media rather than the media technology or time constraints. Perhaps no other media use context is as important as health information. By understanding the relationship between media consumers’ use of traditional and Internet media for health information researchers and practitioners can better focus their messages to their audience. The college student population as a specific at-risk group can greatly benefit from health information made available to them through a wide variety of media channels. Although a great deal of research still needs to be conducted to uncover the driving force behind Media Complementarity Theory, the present research provides more support for the theory that proposes that consumers will use a variety of traditional and new
media channels to gather information regardless of issue salience or perception of channel utility.
REFERENCES


the cognitive-social health information processing (C-SHIP) model.

*Journal of Health Communication, 13*, 389-408.


APPENDIX A

Thinking about the past 12 months, how many times did you hear or come across information about diet or nutrition from each of the following sources when you were not actively looking for it (answer for each source):

<table>
<thead>
<tr>
<th>Source</th>
<th>A. not at all</th>
<th>B. one or two times</th>
<th>C. three or more times</th>
<th>D. I don’t recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magazines</td>
<td></td>
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<tr>
<td>Television</td>
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Thinking about the past 12 months, how many times did you hear or come across information about diet or nutrition from each of the following sources when you were not actively looking for it (answer for each source):
<table>
<thead>
<tr>
<th>Source</th>
<th>Options</th>
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<tr>
<td>Company Web sites</td>
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<tr>
<td>Individual’s Web sites</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
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<td>News Web sites</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
</tr>
<tr>
<td>Video hosting Web sites</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
</tr>
<tr>
<td>Message boards</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
</tr>
<tr>
<td>Podcasts</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
</tr>
<tr>
<td>Individual’s blogs</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
</tr>
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<td>Company blogs</td>
<td>A. not at all B. one or two times C. three or more times D. I don’t recall</td>
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Thinking about the past 12 months, how many times did you hear or come across information about fitness or exercise from each of the following sources when you were not actively looking for it (answer for each source):
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<td>C. three or more times</td>
<td>D. I don’t recall</td>
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<tr>
<td>Radio</td>
<td>A. not at all</td>
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<td>C. three or more times</td>
<td>D. I don’t recall</td>
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<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>Video hosting Web sites</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>Message boards</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>Podcasts</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>Individual's blogs</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>News blogs</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
<tr>
<td>Company blogs</td>
<td>A. not at all B. one or two times C. three or more times D. I don't recall</td>
</tr>
</tbody>
</table>
Please indicate the degree to which you agree or disagree with each of the following statements.

1. Magazines are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

2. Television is effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

3. Radio is effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

4. Books are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

5. Documentaries are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

6. Newspapers are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

7. Company Web sites are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

8. Individual's Web sites are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

9. News Web sites are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--
10. Video hosting Web sites are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree—

11. Message boards are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree—

12. Podcasts are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree--

13. Individual's blogs are effective in providing information about diet or nutrition.
   --Strongly Disagree—Disagree—Neutral—Agree--Strongly Agree—

14. News blogs are effective in providing information about diet or nutrition.
   --Strongly Disagree--Disagree—Neutral—Agree--Strongly Agree--

15. Company blogs are effective in providing information about diet or nutrition.
   --Strongly Disagree--Disagree--Neutral--Agree--Strongly Agree--

Please indicate the degree to which you agree or disagree with each of the following statements.

28. Magazines are effective in providing information about fitness or exercise.
   --Strongly Disagree—Disagree--Neutral--Agree--Strongly Agree--

29. Television is effective in providing information about fitness or exercise.
   --Strongly Disagree--Disagree, Neutral, Agree, Strongly Agree--

30. Radio is effective in providing information about fitness or exercise.
   --Strongly Disagree---Disagree--Neutral--Agree--Strongly Agree—

31. Books are effective in providing information about fitness or exercise.
   --Strongly Disagree—Disagree--Neutral--Agree--Strongly Agree--
32. Documentaries are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

33. Newspapers are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

34. Company Web sites are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

35. Individual's Web sites are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

36. News Web sites are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

37. Video hosting Web sites are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

38. Message boards are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

39. Podcasts are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--

40. Individual's blogs are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree--
41. News blogs are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree—

42. Company blogs are effective in providing information about fitness or exercise.

--Strongly Disagree—Disagree—Neutral—Agree—Strongly Agree—

Please answer each of the following questions by selecting a rating from 1 to 10. Higher numbers indicate more importance.

43. Rate the importance of diet and nutrition information for the United States

1—2—3—4—5—6—7—8—9—10

44. Rate the importance of diet and nutrition information for a typical adult

1—2—3—4—5—6—7—8—9—10

45. Rate the importance of diet and nutrition information for a typical college student

1—2—3—4—5—6—7—8—9—10

46. Rate the importance of diet and nutrition information for yourself

1—2—3—4—5—6—7—8—9—10

47. Rate the importance of fitness and exercise information for the United States

1—2—3—4—5—6—7—8—9—10

48. Rate the importance of fitness and exercise information for a typical adult

1—2—3—4—5—6—7—8—9—10

49. Rate the importance of fitness and exercise information for a typical college student

1—2—3—4—5—6—7—8—9—10
50. Rate the importance of fitness and exercise information for yourself

1—2—3—4—5—6—7—8—9—10

Please answer the following questions.

51. What is your sex? M, F, Prefer not to answer

52. What is your age? ____